

## WHAT IS CLAIMED IS:

1. A voice switching system comprising a receiving-side voice detection processing section which carries out the voice detection processing of a reception signal, a transmitting-side voice detection processing section which carries out the voice detection processing of a transmission signal, a reception voice attenuator which attenuates the reception signal, a transmission voice attenuator which attenuates the transmission signal, and a loss controlling section which controls the losses of the reception voice attenuator and the transmission voice attenuator according to the results of the voice detection processings of the receiving-side voice detection processing section and the transmitting-side voice detection processing section, wherein the receiving-side voice detection processing section and the transmitting-side voice detection processing section each comprises a signal level computing section which computes the amplitude level of the reception signal or the transmission signal in each predetermined sample or frame, a noise level estimating section which computes a noise level estimate from the signal outputted from the signal level computing section, a threshold computing section which computes a threshold for detecting a voice from the noise level estimate, and a voice detecting section which compares the reception signal or the transmission signal with the threshold to detect a voice.

2. A voice switching system comprising a receiving-side voice detection processing section which carries out the voice detection processing of a reception signal, a transmitting-side voice detection processing section which carries out the voice detection processing of a transmission signal, a reception voice attenuator which attenuates the reception signal, a transmission voice attenuator which attenuates the transmission signal, and a loss controlling section which controls the losses of the reception voice attenuator and the transmission voice attenuator according to the results of the voice detection processings of the receiving-side voice detection processing section and the transmitting-side voice detection processing section, wherein the receiving-side voice detection processing section and the transmitting-side voice detection processing section each comprises a signal level computing section which computes the amplitude level of the reception signal or the transmission signal in each predetermined sample or frame, a noise level estimating section which computes a noise level estimate from the signal outputted from the signal level computing section, a threshold updating section which computes a threshold for detecting a voice from the noise level estimate and updates the threshold according to the noise level estimate and

the signal level, and a voice detecting section which compares the reception signal or the transmission signal with the threshold to detect a voice.

3. A voice switching system comprising a receiving-side voice detection processing section which carries out the voice detection processing of a reception signal, a transmitting-side voice detection processing section which carries out the voice detection processing of a transmission signal, a reception voice attenuator which attenuates the reception signal, a transmission voice attenuator which attenuates the transmission signal, and a loss controlling section which controls the losses of the reception voice attenuator and the transmission voice attenuator according to the results of the voice detection processings of the receiving-side voice detection processing section and the transmitting-side voice detection processing section, wherein the receiving-side voice detection processing section and the transmitting-side voice detection processing section each comprises a signal level computing section which computes the amplitude level of the reception signal or the transmission signal in each predetermined sample or frame, a noise level estimating section which computes a noise level estimate from the signal outputted from the signal level computing section, a threshold computing section which computes a threshold for detecting a voice from the noise level estimate, a voice detecting section which compares the reception signal or the transmission signal with the threshold to detect a voice, and an updating amount setting section which sets the updating amount of the noise level estimate in the noise level estimating section according to the result of the detection of the voice detecting section.

4. The voice switching system of claim 2, wherein in the threshold updating section, when the signal level computed in the signal level computing section is higher than the value obtained by multiplying the noise level estimate computed in the noise level estimating section by a predetermined constant, a judgment coefficient for setting the threshold is set to be a predetermined small value; when the signal level is lower than the value obtained by multiplying the noise level estimate by the predetermined constant, the judgment coefficient is set to be a larger value progressively; and when the judgment coefficient becomes larger than a predetermined judgment value, the judgment coefficient is set to be the predetermined judgment value.

5. The voice switching system of claim 3, wherein in the updating amount setting section, when the signal level computed in the signal level computing section is

higher than the threshold computed in the threshold computing section, it is determined that a voice is present, while when the signal level is lower than the threshold, it is determined that no voice is present, and the updating amount of the noise level estimate in the noise level estimating section is changed according to the result of the voice detection.

6. The voice switching system of any one of claims 1 to 5, which further comprises a counting section which counts the number of samples or frames or time after the activation of the system and an initialization performing section which performs the initialization of a noise level estimate for a predetermined time period, thereby performing the initialization of the noise level estimate for a predetermined time period after the activation of the system.

7. The voice switching system of any one of claims 1 to 5, wherein in the noise level estimating section, when the signal level is lower than the noise level estimate, the signal level is set to be the noise level estimate, while when the signal level is higher than the noise level estimate, the noise level estimate is set to be a larger value progressively.

8. A voice switching method performing a receiving-side voice detection processing step in which the voice detection processing of a reception signal is carried out, a transmitting-side voice detection processing step in which the voice detection processing of a transmission signal is carried out, a reception voice attenuating step in which the reception signal is attenuated, a transmission voice attenuating step in which the transmission signal is attenuated, and a loss controlling step in which the losses of the reception voice attenuating step and the transmission voice attenuating step are controlled according to the results of the voice detection processings of the receiving-side voice detection processing step and the transmitting-side voice detection processing step, wherein the receiving-side voice detection processing step and the transmitting-side voice detection processing step each performs a signal level computing step in which the amplitude level of the reception signal or the transmission signal is computed in each predetermined sample or frame, a noise level estimating step in which a noise level estimate is computed from the signal outputted from the signal level computing step, a threshold computing step in which a threshold for detecting a voice is computed from the noise level estimate, and a voice detecting step in which the reception signal or the transmission signal is compared with the threshold to detect a

voice.

9. A voice switching method performing a receiving-side voice detection processing step in which the voice detection processing of a reception signal is carried out, a transmitting-side voice detection processing step in which the voice detection processing of a transmission signal is carried out, a reception voice attenuating step in which the reception signal is attenuated, a transmission voice attenuating step in which the transmission signal is attenuated, and a loss controlling step in which the losses of the reception voice attenuating step and the transmission voice attenuating step are controlled according to the results of the voice detection processings of the receiving-side voice detection processing step and the transmitting-side voice detection processing step, wherein the receiving-side voice detection processing step and the transmitting-side voice detection processing step each performs a signal level computing step in which the amplitude level of the reception signal or the transmission signal is computed in each predetermined sample or frame, a noise level estimating step in which a noise level estimate is computed from the signal outputted from the signal level computing step, a threshold updating step in which a threshold for detecting a voice is computed from the noise level estimate and updates the threshold according to the noise level estimate and the signal level, and a voice detecting step in which the reception signal or the transmission signal is compared with the threshold to detect a voice.

10. A voice switching method performing a receiving-side voice detection processing step in which the voice detection processing of a reception signal is carried out, a transmitting-side voice detection processing step in which the voice detection processing of a transmission signal is carried out, a reception voice attenuating step in which the reception signal is attenuated, a transmission voice attenuating step in which the transmission signal is attenuated, and a loss controlling step in which the losses of the reception voice attenuating step and the transmission voice attenuating step are controlled according to the results of the voice detection processings of the receiving-side voice detection processing step and the transmitting-side voice detection processing step, wherein the receiving-side voice detection processing step and the transmitting-side voice detection processing step each performs a signal level computing step in which the amplitude level of the reception signal or the transmission signal is computed in each predetermined sample or frame, a noise level estimating step in which a noise level estimate is computed from the signal outputted from the signal

level computing step, a threshold computing step in which a threshold for detecting a voice is computed from the noise level estimate, a voice detecting step in which the reception signal or the transmission signal is compared with the threshold to detect a voice, and an updating amount setting step in which the updating amount of the noise level estimate in the noise level estimating step is set according to the result of the detection of the voice detecting step.

11. The voice switching method of claim 9, wherein in the threshold updating step, when the signal level computed in the signal level computing step is higher than the value obtained by multiplying the noise level estimate computed in the noise level estimating step by a predetermined constant, a judgment coefficient for setting the threshold is set to be a predetermined small value; when the signal level is lower than the value obtained by multiplying the noise level estimate by the predetermined constant, the judgment coefficient is set to be a larger value progressively; and when the judgment coefficient becomes larger than a predetermined judgment value, the judgment coefficient is set to be the predetermined judgment value.

12. The voice switching method of claim 10, wherein in the updating amount setting step, when the signal level computed in the signal level computing step is higher than the threshold computed in the threshold computing step, it is determined that a voice is present, while when the signal level is lower than the threshold, it is determined that no voice is present, and the updating amount of the noise level estimate in the noise level estimating step is changed according to the result of the voice detection.

13. The voice switching method of any one of claims 8 to 12, which further performs a counting step in which the number of samples or frames or time after the activation of the system is counted and an initialization performing step in which the initialization of a noise level estimate is performed for a predetermined time period, thereby performing the initialization of the noise level estimate for a predetermined time period after the activation of the system.

14. The voice switching method of any one of claims 8 to 12, wherein in the noise level estimating step, when the signal level is lower than the noise level estimate, the signal level is set to be the noise level estimate, while when the signal level is higher than the noise level estimate, the noise level estimate is set to be a larger value progressively.